

The two latter animals were presented to the Museum collection by Andrew Charlton, Esq., of Liskard, Cheshire, with a series of specimens of *Felis marmoratus* from Malacca.

White-thighed Jacchus, *Jacchus leucomerus*. Pale brown; hair pale, with a broad dark terminal band; hinder part of body and legs darker; face and tail black; throat and beneath paler; front edge of thighs and sides of loins white; ears not tufted.

*Hab.* Bolivia.

Brought to England by Mr. Bridges, and in the collection of the British Museum. This may be *J. melanura*, Geoff.

*General Views on the Classification of Animals.* By J. D. DANA\*.

In Cuvier's classification of animals, the division Radiata includes all invertebrated animals not comprised in either of the subkingdoms Articulata and Mollusca. Consisting thus only of refuse species, and not limited by positive characters, as Owen states, we should not expect that the group could be a *natural* assemblage. No line of subdivision, however, has yet been made out which has met with general favour; yet greater precision has been given to our views of the affinities that run through the animal kingdom, by appealing to the nerves, the seat of sensibility and sentiment, as a basis in classification; and in this manner the subdivisions have been characterized as follows by Dr. Grant:—

I. The *Vertebrata*, having a brain and a spinal cord, constitute the SPINI-VERTEBRATA.

II. The *Mollusca*, having the nerves forming generally a transverse series of ganglia disposed around the œsophagus, the CYCLO-GANGLIATA.

III. The *Articulata*, having no proper brain, and the main cord which runs the length of the body, double, the DIPLO-NEURA.

IV. The *Radiata*, having a radiate structure in the body and the nervous ganglia arranged in a circle, CYCLO-NEURA.

An objection might be made to this system, on the ground of the apparent absence of nerves in some of the lower orders. But a real absence can hardly be concluded from our inability to distinguish them. Many of these animals show by their voluntary motions and sensibility that nervous influences traverse the body: moreover, nervous matter is secreted in lines. We can therefore only infer the indistinctness, and not the absence of nerves, from our ineffectual efforts to trace them out; and we must consequently be guided by general structure, in determining the relations of groups, when the nerves fail of giving aid.

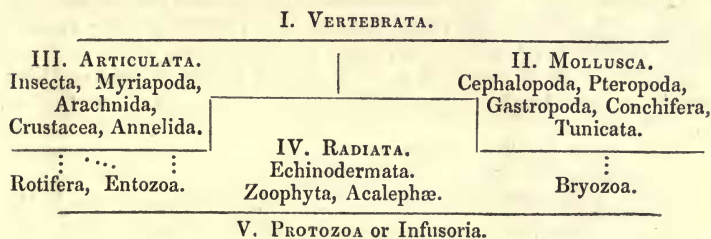
The above arrangement fails, in some respects, of presenting a clear idea of the system in nature, although highly philosophical in its general features. A study of the animal kingdom, as has been lately shown, brings to light lines or general systems of development

\* Proceed. Acad. Nat. Sci. Philad. ii. p. 281, Oct. 1845.

branching up from the lowest Infusoria to the higher grades of life. It is not true that the forms among the *lower* grades are actually copied in any of the imperfectly developed young of the *superior*; yet there is some general analogy, sufficient to indicate that the former commence on the same system of development with some of the latter, although carried essentially out of the direct upward line by the peculiar vital forces of the species. The Rotifera are decidedly crustacean in type. Their stout mandibles are precisely those of the Cyclopacea in position, and also in general form; and in their mode of reproduction the animals are closely similar; yet no young crustacean is ever a Rotifer. The latter belongs to the same system of development with the former, but is a distinct branch, from the regular line, characterized by the peculiar natatory organs, which appear to be the analogues of the branchial or basal appendages to the feet in Crustacea. The same reasoning applies to the Bryozoa or Flustroid polyps, which are as nearly allied to the Tunicata as the Rotifers to Crustacea\*. It is a side-development from the imaginary line which connects the Infusoria with the tunicated mollusks. The Entozoa afford other examples, one branch of them passing into the Crustacea through the *Lernæidæ* and *Caligidæ*, and another into the Annelida.

These remarks are intended to support no monad or Lamarckian theory, but only to elucidate the established principle, that there are in nature certain distinct systems or types of development. Each species is developed with some reference to one or the other of these systems, but through the agency of the vital forces peculiar to itself—forces which there is reason to believe only creative power can change.

In accordance with these principles, the several orders of animals may be arranged as follows:—



A radiated structure characterizes in general the simplest forms of animal life. Passing up from the monad globule, this structure has its highest development in the Echinoderms. Among Zoophytes,

\* The Bryozoa have been placed near the Rotifera; but the absence of mandibles, as well as their peculiar type of structure, separates them widely from these Crustaceoid species, and allies them as closely to the Tunicata, with which they were first associated by Thompson, under the name of Polyzoa. Lister has a finely illustrated article on this subject in the 'Philosophical Transactions' for 1834, p. 365.

the *Hydra* forms the first step upward, in which the digestive cavity is a mere sac, which will work equally well inside-out, and the mode of reproduction is extremely simple. From this group we pass to the *Actinia*, in which there is a distinct stomach and a series of fleshy lamellæ around the internal cavity—the first rudiments of an isolation of the functions of digestion and generation; but the circulating fluid is only the elaborated chyle mingled with more or less water from without. A step further and we find separate organs for the functions of the liver and a circulating system in some Echinoderms. Through the Bryozoa the Infusoria are connected with the Tunicata and the other mollusks; and through the Rotifera and Entozoa they connect with the Articulata, thus passing by each way, out of the true Radiate type, into that which characterizes the higher subkingdoms. The Bryozoa, Rotifera and Entozoa may be arranged in the subkingdom Radiata, or with the Mollusca and Articulata, whose types of structure they exhibit, though under a Radiate form.

The Echinoderms, although so strikingly peculiar in some species, the *Echini*, yet, through the *Holothuria*, bear closely upon the Articulata; while the Acalephs incline toward the Mollusca.

In the above remarks, it is not attempted to trace out all the gradations in the groups referred to, but only the most prominent. The animal kingdom is throughout a network of affiliations, yet there are main trunks and larger branches, to which the smaller anastomosing ramifications are subordinate. Much study will be required before the system of nature from the Protozoa up can be correctly mapped out.

*On two new species of Antelopes in the British Museum Collection.*

By J. E. GRAY, F.R.S.

*Senegal Gazelle. Gazella rufifrons.*—Bay-brown (yellower in summer), with a paler upper and oblique lower black streak; front of face yellow bay; face-streak, back of feet, chest, belly and vent white; tail black; edge of anal disc dark; knees without any tuft, with a ridge of rather longer hairs nearly to the foot. Larger than *G. Dorcas*.

*Var.* Nose black in front; young paler.

*Hab.* Senegal. Purchased in Paris.

Easily known from *G. Dorcas* by the want of the knee-tuft. We have two males, two females and a kid. The *Corinne*, F. Cuv. Mam. Lithog. t. , not of Buffon.

*Isabella Gazelle. Gazella Isabella.*—Fur short, very soft; pale yellowish brown, with a broad, rather paler oblique streak on the upper part of the sides; knee-tufts, front of face and lower face-streak darker yellow-brown; upper face-streak, chest, belly, vent and inside of the limb white; tail black. Young paler, lower part of sides rather darker.

*Hab.* N. Africa: Egypt, J. Burton, Esq.; Cordofan, M. Sundevall. We have three males, one female and three young.